



U.S. Department of Energy
Office of Civilian Radioactive Waste Management



Yucca Mountain Project – Lessons Learned/Generic Implications

Presented to:
Society for Effective Lessons Learned Sharing (SELLS)

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Yucca Mountain Project Metrics

1. Background
2. Application at the Yucca Mountain Project (YMP)
3. Future Metrics



Background

- **During the Department of Energy (DOE) Executive Safety Conference in December 2001, Undersecretary Robert Card asked for an annunciator-type performance metric system for the DOE Complex**



Background (cont.)

- **The annunciator-type system uses key performance indicators (KPIs) as its basis with a color rollup scheme established by the commercial nuclear industry**
- **It provides a quick status summary, which can be modified to suit various customers**
- **The underlying principle behind each metric is the use of objectivity to assess performance**



Background (cont.)

- **This system provides key information at a glance but provides the ability to “drill down” to identify issues and actions**
- **Instead of focusing on events, it provides an easy assessment of trends**
- **It also encourages the sharing of expertise and knowledge and allows benchmarking of successes as well as analyzing problem areas**



Background (cont.)

- **Purpose of Performance Indicators**
 - **Performance Indicators provide an objective reference to provide a basis for making management decisions**
 - **Performance Indicators focus on critical areas that can impact the overall mission**



Background (cont.)

- **Scope of Performance Indicators**
 - **Performance Indicators are derived from every aspect of our work, culminating in the success of the mission**
 - **The lowest level of indicator applies to first-line managers and their direct reports**
 - **The highest level indicator applies to senior managers to provide an indication of mission success or failure**



How Are Performance Indicators Displayed?

- The Annunciator Panel is the method of displaying the performance indicators
- The Annunciator Panel is divided into primary indicators on the far left, with secondary indicators to the right
- Beneath the secondary metrics are lower third and fourth level metrics

Yucca Mountain Project Annunciator Panel										
Performance Indicators based on data for: August 2004										
W o r k E x e c u t i o n	Primary		Secondary							
	G G G G		Y G G G *	G G Y G	Y Y Y G	G G G G	G G Y Y *			
	1.1 Licensing		1.1.1 License Application Development	1.1.2 NRC Interactions	1.1.3 License Support Network Input	1.1.4 NRC Commitments	1.1.5 Key Technical Issues			
	G		B > G	G	G	G	Y			
	G G G G		Y G Y Y	G G G G	G G G G	G G G G				
	1.2 Engineering/Design		1.2.1 Surface Facilities	1.2.2 Subsurface Facilities	1.2.3 Engineered Barriers	1.2.4 Regts & Integration Management				
	G		Y	G	G	B > G				
	G G Y Y		G Y Y R	G R R R	G G G G					
	1.3 Safety Analysis		1.3.1 TSPA	1.3.2 Performance Confirmation	1.3.4 Preclosure Safety Analysis					
			R	Y	B > G					
	G G G G		G G G G	R R R R	G G G G					
	1.3.6 Data Qualification		1.3.7 Model Validation	1.3.8 Software Qualification						
	Y		R	G						
	G G Y G		Y Y Y G	G G G G	G G G G	G G Y G				
	1.4 Site Operations		1.4.2 Site Maintenance Activities	1.4.4 Operations	1.4.5 Bechtel Nevada	1.4.6 Site Critical Systems				
	G		G	G	G	G				



History Indicator

- The four boxes in the upper left corner represents the history of indicator status over the past four months
- Each block is color coded based on the color code set-points for that metric



What Does The Color Score Mean?

- Each level of a Performance Indicator is assigned a color score based on set-points assigned by the metric owner
- The base metric is the lowest and most detailed level of metrics in the Annunciator Panel drill down
- Generally, base metrics will include charting of raw data, the analysis of the performance, and corrective or sustaining actions necessary to continually improve performance
- The base metric contributes to the color determination of the higher level roll-up metric



Why a Roll-Up?

- **A senior manager looks at performance from a mission perspective**
- **Mid-level managers look at performance from a strategic perspective**
- **First-line managers look at performance from an activity perspective**
- **Measuring performance begins at the lowest activity level and flows into higher level mission critical indicators**
- **The roll-up provides senior-level managers with a view of the health of the project from a single glance**



Types of Measures

- **Leading Indicators**
 - A measure of the input(s) into a product, service, or process such that evaluation of the input provides an indication of future results of the product, service, or process
 - Predictive in nature
 - Example: Personnel turnover rate may correlate to training costs
- **Real-time Indicators**
 - A measure of the current state or condition of a product, service or process
 - Real-time does not imply that the measure is instantaneous or continuous, but that the measure is timely enough that a decision may be made in order to effectively bring about change to the outcome
 - Provides current status
 - Example: Current personnel turnover rate compared to planned staffing curve
- **Lagging Indicators**
 - A measure of the results of a process or service in meeting the customers expectations of quality, timeliness, and effectiveness
 - Provides historical information about past events
 - Example: Personnel turnover rate compared to the national average provides information about past performance



Metrics Characteristics

- **Effective linkage and integration to management goals, objectives, and mission critical activities**
- **Balance between leading, lagging, and real time indicators**
- **Properly identified set-points to ensure proper triggering of management actions**
- **Meaningful data, appropriate collection methods, data quality, appropriate smoothing, and adequate sample size**
- **Effective presentation**
 - **If management does not get your message in 15 seconds, you will lose their attention**



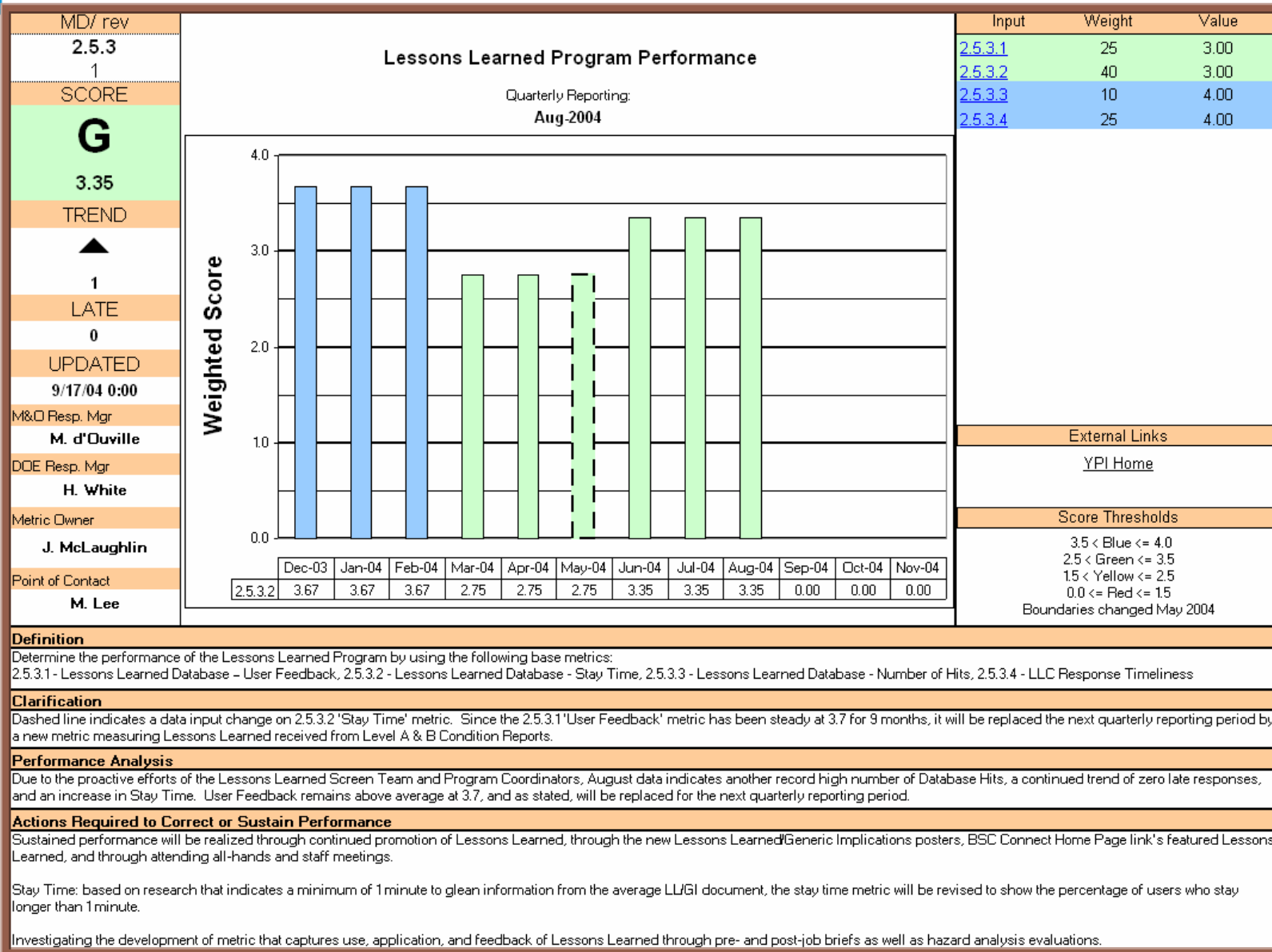
Application at YMP

YMP Annunciator Panel as of August 2004

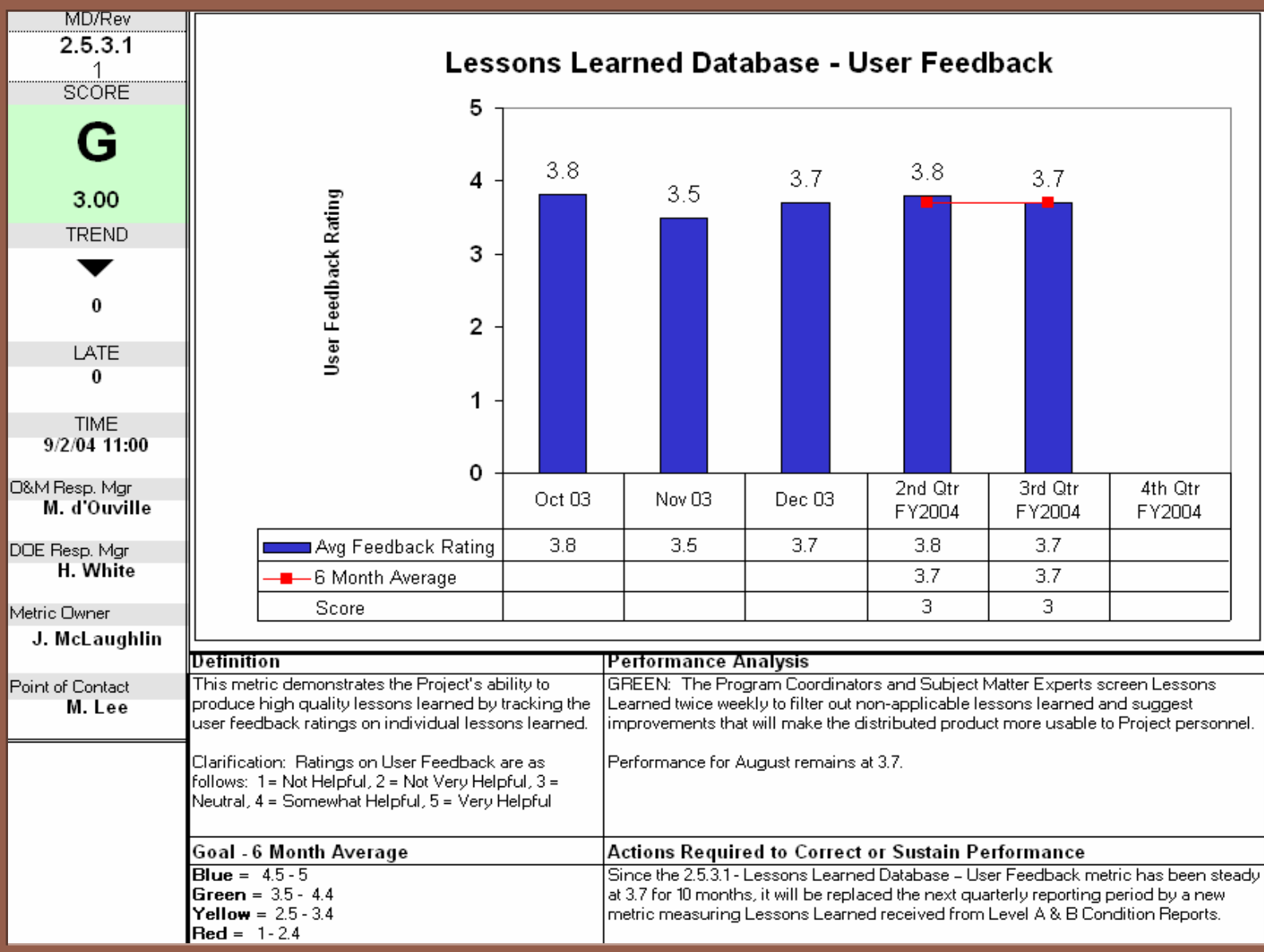
Management	Primary	Secondary					
	G G G G *						
	2.1 Project Support						
	G						
	G G G G	G G G G	G G G G	G G B B			
	2.2 Safety, Health, and the Environment	2.2.1 Incidents	2.2.2 ES&H Program Awareness	2.2.3 ES&H Reporting			
	G	B > G	G	B			
	Y Y Y Y	R R R R	G G G G	G G G G	Y Y Y Y	G G G G	
	2.3 Quality Assurance	2.3.1 Product Quality	2.3.2 Process Quality	2.3.3 Vendor Quality	2.3.4 Corrective Action Program Quality	2.3.5 Quality Systems	
	Y	R	G	G	Y	G	
	Y Y Y Y	G G G G	Y Y Y Y	Y Y G G	Y R R Y		
	2.4 Corrective Action Mgmt System	2.4.1 CAP Effectiveness	2.4.2 Self Reporting Culture	2.4.3 Timely Analysis & Plan Development	2.4.4 Timely CA Resolution		
	Y	B > G	Y				
	Y Y G G	G G G G	R R W W	G G G G	W Y G		
	2.5 Management Framework	2.5.1 Procedures	2.5.2 Requirements Management	2.5.3 Lessons Learned Program	2.5.4 Integrated Assessment Program		
	G	G	D	G			
	Y Y Y Y *	Y Y Y Y	Y Y Y Y	Y Y Y Y	G G G G	Y R Y Y	
	2.7 Project Management	2.7.1 Cost Performance (Overall CPI)	2.7.2 Schedule Performance (Overall SPI)	2.7.3 Scope Baseline	2.7.4 Risk & Contingency	2.7.5 Key Deliverable Critical Path Float	
	G	G	Y	D	G	G	
	G G G G	G G G G	Y Y G G	Y Y G G	Y G Y G		
	2.8 Organizational Climate	2.8.1 Employee Concerns	2.8.2 Safety Culture	2.8.3 SCWE	2.8.5 Internal Comm.		
	G	G	G	G	G		



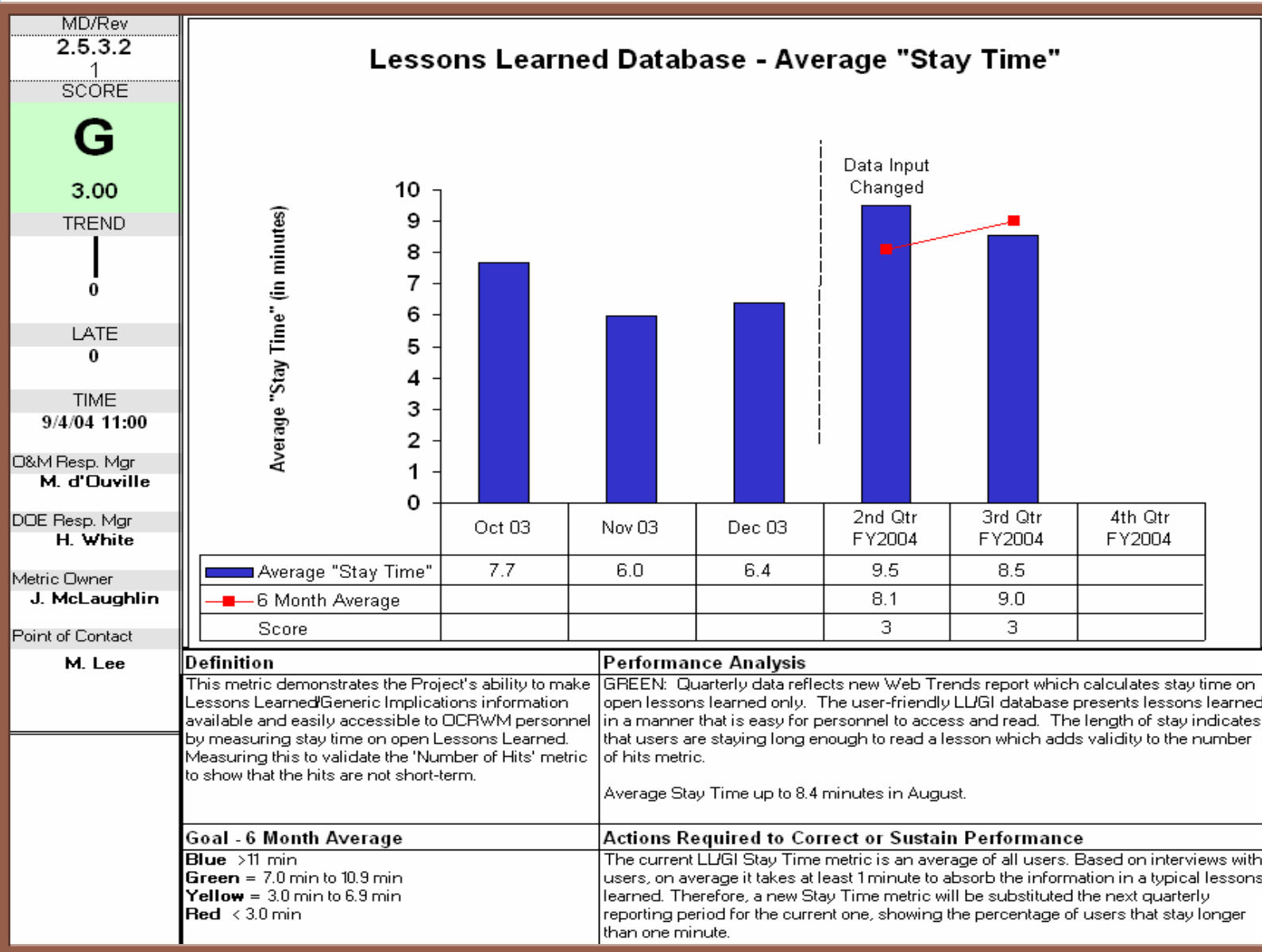
Application at YMP (cont.)



Application at YMP (cont.)

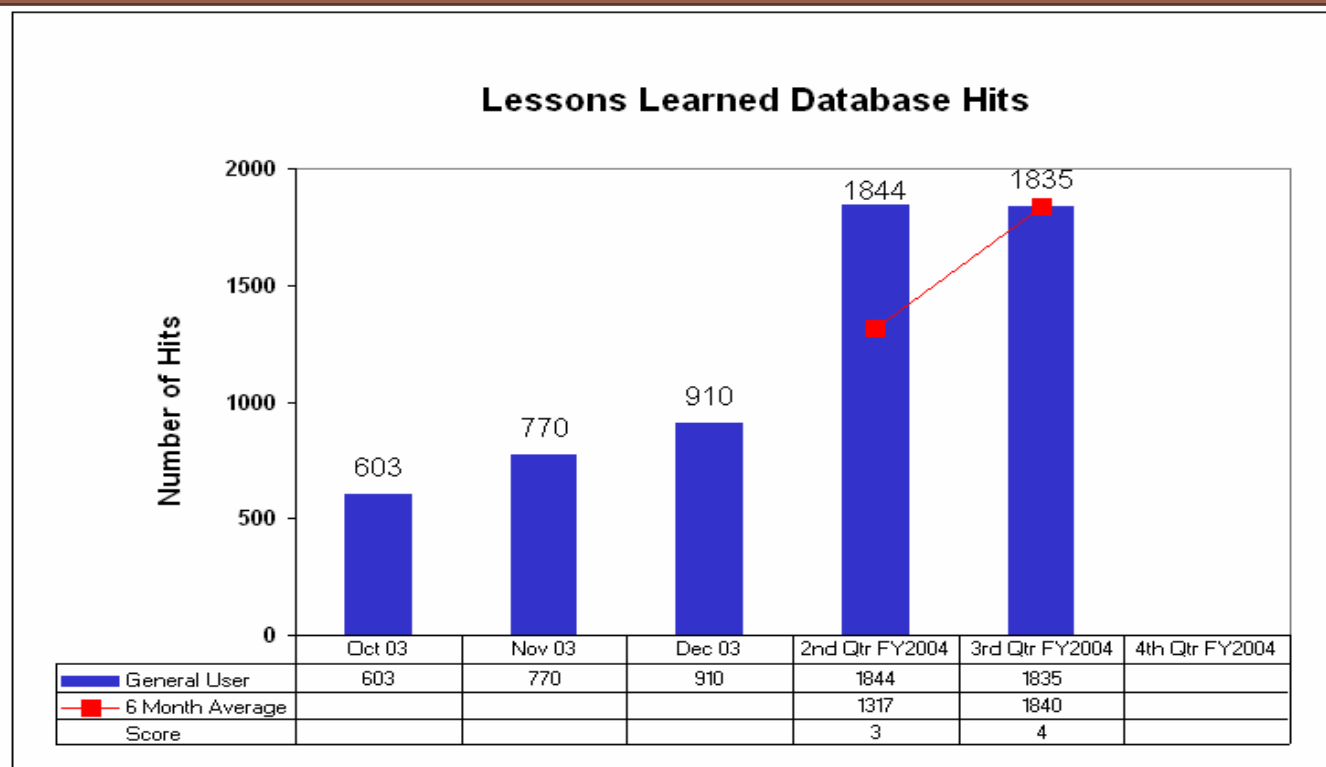


Application at YMP (cont.)



Application at YMP (cont.)

MD/Rev
2.5.3.3
1
SCORE
B
4.00
TREND
▲
1
LATE
0
TIME
9/2/04 11:00
O&M Resp. Mgr M. d'Ouille
DOE Resp. Mgr H. White
Metric Owner J. McLaughlin
Point of Contact M. Lee

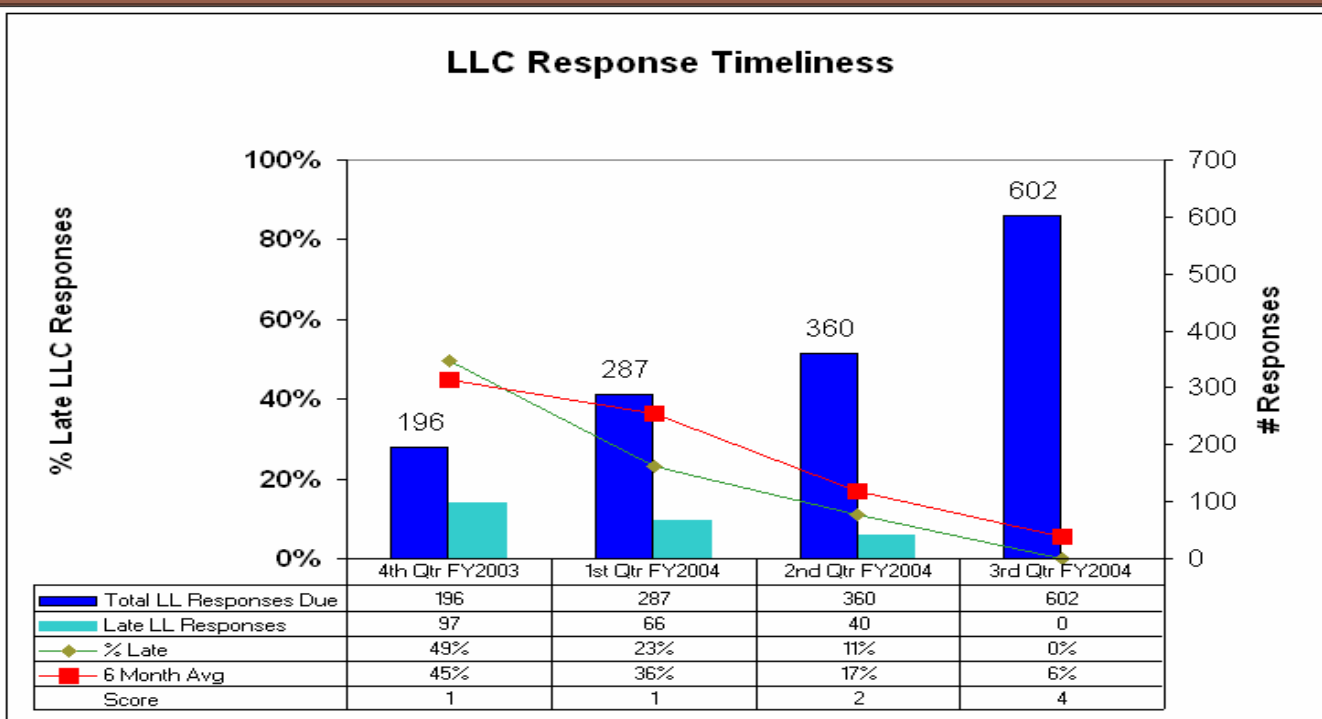


Definition	Performance Analysis
<p>This metric demonstrates the Project's ability to make Lessons Learned/Generic Implications information available and easily accessible by OCRWM personnel.</p> <p>General User = User hits other than those related to the administration of the program.</p> <p>Clarification: Quarterly data is averaged.</p>	<p>BLUE: A new LUGI poster has been designed and placed in Summerlin campus buildings (including Hillshire) to further raise awareness and promote the LUGI program. Additionally, a link to a featured lesson has been placed on the BSC Connect home page. Recent ISM and QAMA Assessments have also brought attention to the LUGI Program.</p> <p>August saw an all time record number of hits at 2945.</p>
Goal - 6 Month Average	Actions Required to Correct or Sustain Performance
<p>Blue > 1500</p> <p>Green = 1000 - 1500</p> <p>Yellow = 500 - 999</p> <p>Red < 500</p>	<p>Continue to promote LUGI program through posters and link on BSC Connect home page.</p> <p>A database improvement is planned whereby database hits will be 'binned' allowing a determination to be made of how the information in the database is being used.</p>



Application at YMP (cont.)

MD/Rev
2.5.3.4
0
SCORE
B
4.00
TREND
▼
-1
LATE
0
TIME
9/2/04 11:00
O&M Resp. Mgr
M. d'Ouille
DOE Resp. Mgr
H. White
Metric Owner
J. McLaughlin
Point of Contact
M. Lee



Definition	Performance Analysis
<p>This metric demonstrates the organizational Lessons Learned Coordinator's (LLC's) ability to respond to lessons learned within target dates. Demonstrates the project's commitment to continuous improvement by learning from self and others 24/7.</p> <p>Clarification: Procedural target date of 20 days for Lessons Learned Coordinators (LLCs) to provide an initial response to the Lessons Learned Program Coordinator.</p>	<p>BLUE - The Lessons Learned Program Coordinator (LLPC) has placed an increased emphasis on lowering the number of late responses through meetings, e-mails and phone calls to the LLCs, resulting in a downward trend in late responses. Specifically, the LLPC sends reminder e-mails 5-7 days, and phones 0-2 days before LLC responses are due.</p> <p>August continues the trend of zero late responses.</p>
Goal - 6 Month Average	Actions Required to Correct or Sustain Performance
<p>Blue =< 7% late</p> <p>Green = 8% - 14% late</p> <p>Yellow = 15% - 21% late</p> <p>Red >21% late</p>	<p>The Lessons Learned Program Coordinator will continue to be proactive sending e-mails 5-7 days and calling 0-2 days before LLC responses are due.</p>



Application at YMP (cont.)

- **Performance Analysis**

- **Using pre-defined set-points, the metric owner provides a detailed analysis of performance**
- **Analysis includes:**
 - ◆ **Assessment of current performance and its relationship to past performance**
 - ◆ **Explanation of *why* metric performance is what it is, *including* the drivers behind it**
 - ◆ **Expected future results and impacts to critical activities associated with the metric**



Application at YMP (cont.)

- **Actions to Improve or Sustain Performance**
 - Identify specific actions that are being taken to:
 - ◆ Continue excellent performance, or
 - ◆ Improve current performance
 - If action is required, initiate a Condition Report in accordance with [AP-16.1Q, Condition Reporting And Resolution](#)
 - If warranted, initiate a Lessons Learned in accordance with [AP-REG-001, Managing Lessons Learned](#)
 - Improving/sustaining actions should be the sufficient and necessary actions to bring about the desired results
 - Provide dates when actions will be completed



Future Metrics

- **Investigating the development of a metric that captures use, application, and feedback of Lessons Learned through pre- and post-job briefs as well as hazard analysis evaluations**

